

REMARKS

Claims 15-19 and 21-25 are pending in the application. Claims 15-19 and 21-25 were rejected.

AMENDMENTS

Claims 15, 21, 24 and 25 were amended. Claims 26 - 30 were added.

CLAIM OBJECTIONS

Claim 25 was objected to as being of improper dependent form. Claim 25 was amended to depend from claim 24, consistent with the Examiner's suggestion.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Claims 15, 17 and 19 were rejected under 35 U.S.C. § 102(b), as being anticipated by Kaganowicz, U.S. Patent No. 5,011,268 (hereinafter Kaganowicz).

Regarding claim 15 the Examiner states that Kaganowicz teaches, *inter alia*, "constituent materials having a stoichiometric ratio, ... , for the purpose of providing an effective alignment layer ... with the required pretilt angle ..."

Claim 15 claims, *inter alia*, "the constituent materials have a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material."

Kaganowicz discloses "an alignment layer for a liquid crystal display device which provides optimum molecular alignment, tilt angle and resistivity is formed by depositing, using glow discharge, an inorganic silicon based material onto the electrodes of the liquid crystal cell (abstract)." Kaganowicz does not disclose constituent materials that have "a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material" as claimed in claim 15. Kaganowicz merely teaches an alignment layer. Nowhere does Kaganowicz teach a predetermined pretilt angle imparted by a stoichiometric ratio. Further, even assuming arguendo

that Kaganowicz' alignment layer has an effect on a pretilt angle, the pretilt angle is not predetermined. Therefore, Kaganowicz fails to teach all the limitations of claim 15.

Claims 17 and 19 depend from claim 15. Claims 17 and 19 are believed to be allowable for at least the reasons given for claim 15.

Reconsideration of the rejection is respectfully requested.

Claim 21 was rejected under 35 U.S.C. § 102(b), as being anticipated by Kaganowicz, as evidenced by McBride, U.S. Patent No. 5,348,913 (hereinafter McBride).

Regarding claim 21, the Examiner states that Kaganowicz teaches, *inter alia*, “an amount of at least one of the constituent materials for providing a stoichiometric ratio of the constituent materials of the alignment layer, wherein the amount provides a given pretilt angle of the alignment layer different than the preexisting pretilt angle of the alignment layer ...”

Claim 21 claims, *inter alia*, “the constituent materials of the alignment layer have a stoichiometric ratio that imparts a preexisting pretilt angle to the liquid crystal material, and the additional amount of at least one of the constituent materials imparts a predetermined pretilt angle to the liquid crystal material different than the preexisting pretilt angle of the alignment layer.”

Kaganowicz discloses “an alignment layer for a liquid crystal display device which provides optimum molecular alignment, tilt angle and resistivity is formed by depositing, using glow discharge, an inorganic silicon based material onto the electrodes of the liquid crystal cell (abstract).” Kaganowicz does not disclose that “constituent materials of the alignment layer have a stoichiometric ratio that imparts a preexisting pretilt angle to the liquid crystal material” as claimed in claim 21. Kaganowicz merely teaches an alignment layer. Nowhere does Kaganowicz teach a predetermined pretilt angle imparted by an amount of at least one of the

constituent materials, essentially as claim 21. Further, even assuming arguendo that Kaganowicz' alignment layer has an effect on a pretilt angle, the pretilt angle is not predetermined. Therefore, Kaganowicz fails to teach all the limitations of claim 21.

The Examiner appears to have referred to McBride to evidence that a characteristic of "contact angle" not disclosed in the Kaganowicz reference is inherent, pursuant to MPEP 2131.01(C). In McBride "contact angle" is the angle that a liquid drop, such as water, makes with the substrate. McBride does not discuss the pretilt angle of molecules in a liquid crystal material. Applicant respectfully submits that there is no correlation between the "contact angle" of McBride and the pretilt angle of Applicant or the tilt angle of Kaganowicz. Further, McBride does not teach a predetermined pretilt angle, essentially as claim 21. Therefore, McBride fails to cure the deficiencies of Kaganowicz.

Therefore, Kaganowicz as evidenced by McBride, fails to teach all the limitations of claim 21. The Examiner's reconsideration of the rejection is respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103

Claims 16 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaganowicz as applied to claims 15, 17 and 19 above, and further in view of Onuma, U.S. Patent No. 5,353,141 (hereinafter Onuma).

Regarding claims 16 and 18, the Examiner states that Kaganowicz teaches, *inter alia*, "constituent materials having a stoichiometric ratio to provide a given pretilt angle ..." The Examiner also states that Onuma teaches, *inter alia*, "that SiC_x can be used instead of SiO_x ... and x provides a stoichiometric relationship, which allows the SiC_x to exist in stable form."

As described for claim 15 above, Kaganowicz does not disclose constituent materials that have "a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal

material.” Onuma discloses providing “a uniform alignment state through a high pretilt aligning treatment by rubbing an alignment film.” However, Onuma does not disclose constituent materials that have “a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material.” Therefore, Onuma does not rectify the deficiencies of Kaganowicz. Claims 16 and 18 depend from claim 15. Accordingly, claims 16 and 18 are neither anticipated nor rendered obvious in light of the cited references, alone or in combination. It is believed that claims 16 and 18 overcome the rejections under 35 U.S.C § 103(a) and are allowable for at least the reasons given above for independent claim 15.

Claim 22 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaganowicz as applied to claims 15, 17 and 19 above, and further in view of Chaudhari, U.S. Patent No. 6,195,146 (hereinafter Chaudhari).

Regarding claim 22, the Examiner states that Kaganowicz teaches, *inter alia*, “constituent materials having a stoichiometric ratio to provide a given pretilt angle.” The Examiner also states that Chaudhari teaches, *inter alia*, “that the irradiation method is for the purpose of providing stability and uniformity of the pretilt angle.”

As described for claims 15 and 21 above, Kaganowicz does not disclose constituent materials that have “a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material.” Chaudhari discloses “a surface of at least one alignment layer is bombarded by a particle beam of an adjustable energy using a voltage less than 200 V so that the liquid crystal molecules proximate the surface are induced to a predetermined pretilt angle.” However, Chaudhari does not disclose constituent materials that have “a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material.” Therefore, Chaudhari does not rectify the deficiencies of Kaganowicz. Accordingly, claim 22 is neither anticipated nor rendered

obvious in light of the cited references, alone or in combination. It is believed that claim 22 overcomes the rejection under 35 U.S.C § 103(a) and is allowable for at least the reasons given above for independent claims 15 and 21.

Claims 23 and 25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kaganowicz, as evidenced by McBride, as applied to claim 21 above, and further in view of Chaudhari.

Regarding claims 23 and 25, the Examiner states that Kaganowicz, as evidenced by McBride, teaches, *inter alia*, “an alignment layer wherein a amount of at least one of the constituent materials for providing a stoichiometric ratio of the constituent materials of the alignment layer, wherein the amount provides a given pretilt angle different than the preexisting pretilt angle of the alignment layer.” The Examiner also states that Chaudhari teaches, *inter alia*, “that the irradiation method is for the purpose of providing stability and uniformity of the pretilt angle.”

As described for claim 21 above, Kaganowicz does not disclose constituent materials that have “a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material.” Chaudhari discloses “a surface of at least one alignment layer is bombarded by a particle beam of an adjustable energy using a voltage less than 200 V so that the liquid crystal molecules proximate the surface are induced to a predetermined pretilt angle.” However, Chaudhari does not disclose constituent materials that have “a stoichiometric ratio that imparts a predetermined pretilt angle to the liquid crystal material.” Therefore, Chaudhari does not rectify the deficiencies of Kaganowicz. Accordingly, claims 23 and 25 are neither anticipated nor rendered obvious in light of the cited references, alone or in combination. It is believed that

claims 23 and 25 overcome the rejection under 35 U.S.C § 103(a) and are allowable for at least the reasons given above for independent claim 21.

Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Kato, U.S. Patent No. 5,745,205 (hereinafter Kato). Regarding claim 24, the Examiner states essentially that Kato teaches or suggests all the limitations of claim 24.

Claim 24 claims, *inter alia*, “the first material imparts a homeotropic alignment in the liquid crystal material, the second material imparts a homogeneous alignment in the liquid crystal material and the second material is in an amount to impart a predetermined pretilt angle to the liquid crystal material.”

Kato does not teach or suggest “wherein the first material imparts a homeotropic alignment in the liquid crystal material, the second material imparts a more homogeneous alignment in the liquid crystal material than the first material and the second material is in an amount to impart a predetermined pretilt angle to the liquid crystal material.” Nowhere does Kato teach or suggest imparting a predetermined pretilt angle. Kato does not teach or suggest that a pretilt angle is predetermined by an amount of a second material of an alignment layer. Therefore, Kato fails to teach or suggest all the limitations of claim 24. Reconsideration of the rejection is respectfully requested.

DEPENDENT CLAIMS

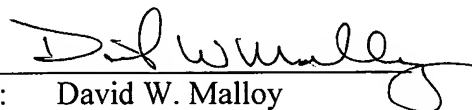
Since claims 16-19, 26-27; 22-23, 28-29; and 25, 30 depend from independent claims 15; 21; and 24, respectively, it is believed that the dependent claims are allowable for at least the reasons given above for the independent claims. Therefore, Applicant has not independently addressed all of the rejections of the dependent claims. However, Applicant reserves the right to

address any individual rejections of the dependent claims should such be necessary or appropriate.

CONCLUSION

Applicant respectfully submits that claims 15-19 and 22-30 as herein presented are allowable over the prior art of record, taken alone or in combination, and that the respective rejections and objection be withdrawn. Applicant further respectfully submits that the application is hereby placed in condition for allowance which action is earnestly solicited.

Respectfully submitted,


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